

# Demystifying digital dark matter: A new standard to tame technical debt

Technical debt hinders growth. A new metric makes it easier to quantify how much it's hurting companies.

*This article is a collaborative effort by Sven Blumberg, Rahul Das, Jens Lansing, Nils Motsch, Björn Münstermann, and Rob Patenge, representing views from McKinsey Digital.*



**Technical debt**<sup>1</sup> is like dark matter: you know it exists, you can infer its impact, but you can't see or measure it. Product delays, hidden risks, spiraling costs, and even engineers leaving in frustration are all common symptoms.

Some 30 percent of CIOs we surveyed<sup>2</sup> believe that more than 20 percent of their technical budget ostensibly dedicated to new products is diverted to resolving issues related to tech debt. Furthermore, they estimate that tech debt amounts to 20 to 40 percent of the value of their entire technology estate (before depreciation).<sup>3</sup> Tech debt continues to rise in the majority of organizations we examined. Furthermore, almost half of firms that completed

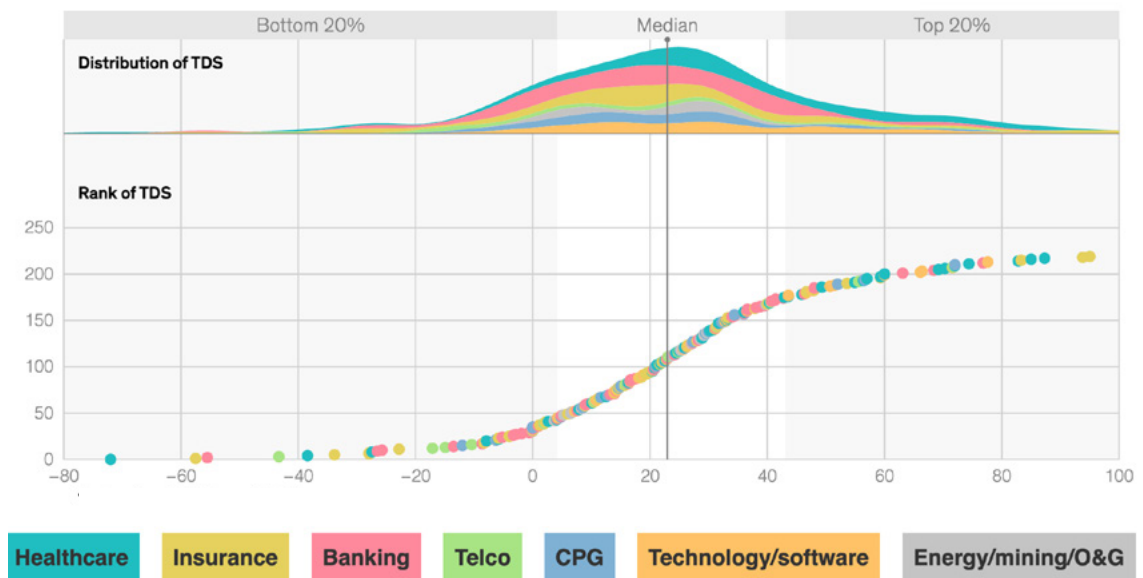
modernization programs were unsuccessful in reducing technology debt.

In response to this challenge, we have pioneered the Tech Debt Score (TDS), a simple metric that gives organizations a rapid way to quantify their technical debt and compare themselves against peers.

This score helps companies rapidly understand the scale of their problem, identify what a feasible target state could be, and determine the corresponding economic benefit from an improved TDS.

## The Tech Debt Score can help organizations quantify their tech debt and compare to industry peers.

### Median distribution and ranking of TDS scores across companies and sectors



<sup>1</sup> Tech debt is the off-balance-sheet accumulation of all the technology work a company needs to do in the future.

<sup>2</sup> McKinsey carried out a survey of organizations' tech debt in July 2020. We surveyed 50 CIOs of financial services and technology companies with revenues in excess of \$1 billion.

<sup>3</sup> Vishal Dalal, Krish Krishnakanthan, Björn Münstermann, and Rob Patenge, "Tech debt: Reclaiming tech equity," McKinsey, October 6, 2020.

## Tech Debt Score and business performance

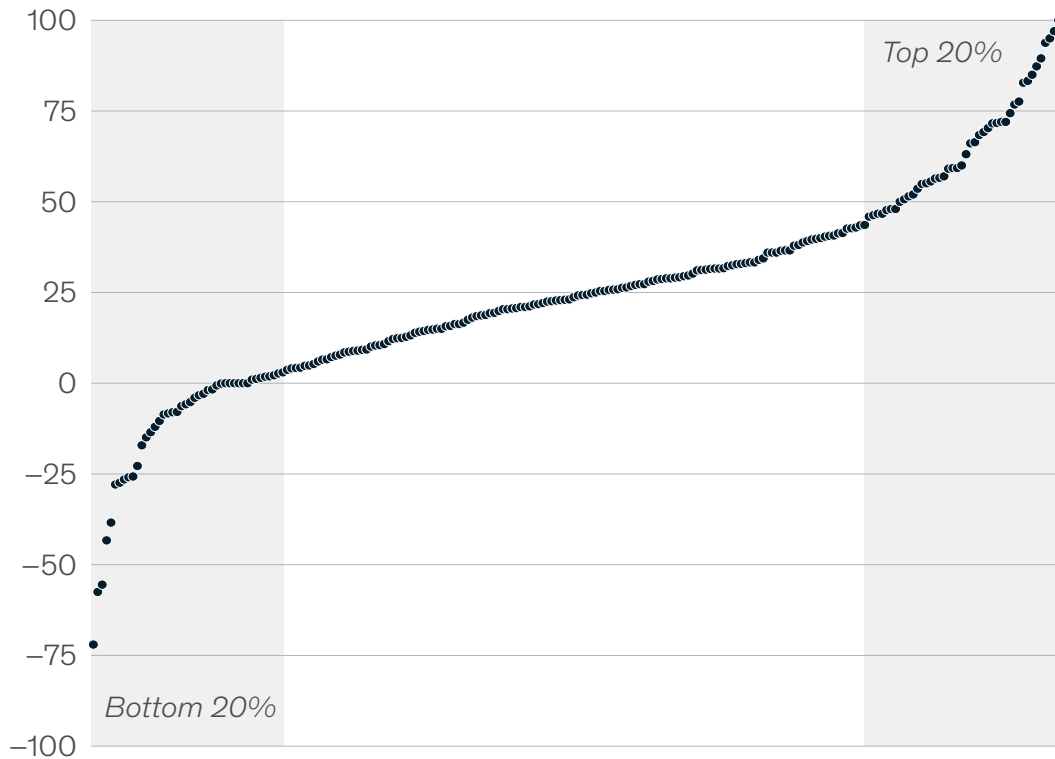
Analysis of tech debt at 220 companies across five geographies and seven sectors revealed that there is a significant correlation between the TDS and business performance. Companies in the 80th

percentile for TDS have revenue growth that is 20 percent higher than those in the bottom 20th percentile and 10 percent higher than the average (Exhibit 1). Improving your tech-debt position helps to direct technology resources toward initiatives that increase revenue. It may also be true that

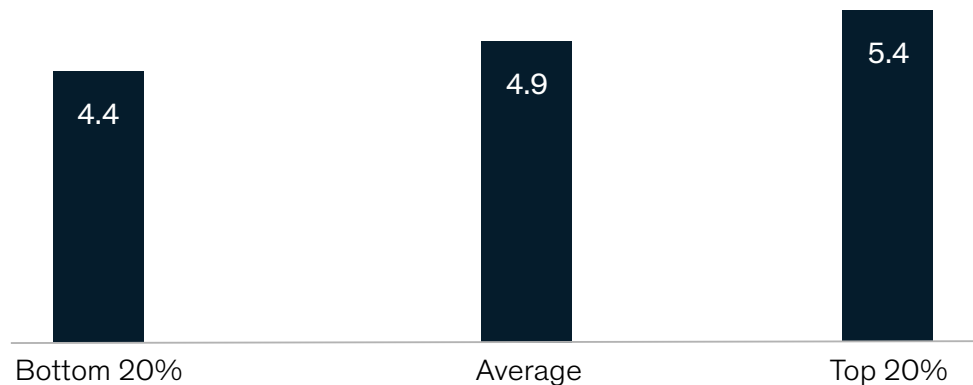
Exhibit 1

**A high TDS correlates to higher revenue growth.**

### TDS percentile breakdown



### Revenue CAGR,<sup>1</sup> %



<sup>1</sup>Compound annual growth rate, based on CIO responses for firm annual growth rates over the past five years.

companies with stronger business performance are able and more willing to proactively pay down technology debt, lowering risk and securing the path for longer-term performance.

Conversely, poor TDS performance leads to a downward spiral of failed efforts to modernize IT, resulting in ever more tech debt. Companies in the bottom 20th percentile for TDS are 40 percent more likely to have incomplete or canceled IT modernizations than those in the top 20 percent.

In our experience, this poor performance is a result of companies' uncertainty about where to start or how to prioritize their tech-debt efforts. They spend significant amounts of money on modernizing applications that aren't major contributors to tech debt, for example, or try to modernize applications in ways that won't actually reduce tech debt. Companies in the bottom 10th percentile for TDS, in fact, sink almost half of their IT change spend (versus spending on maintenance) into applications that they would just as soon retire. One bank was on the verge of committing to a roughly \$100 million effort to replace an aging system of record, for instance, before realizing that it was so ingrained into the rest of the IT landscape that replacing it wouldn't relieve any of the pain points faced by its developers.

Effective spend to pay down tech debt seems to be a product of scale and focus. Companies in the bottom 20th percentile invest 50 percent less than the average on modernization to remediate tech debt. Additionally, they are 40 percent more likely to have incomplete or canceled tech-modernization programs than those in the top 20th percentile. Once companies have materially paid down their debt, the top performers are then disciplined about returning their spend to broader IT priorities.

## How to manage your tech debt

Systematic tech-debt management is seldom practiced, in our experience. But it is possible to pay tech debt down. Our data show, in fact, that even older companies, where one might assume there has been more time to build up tech debt, can effectively manage it. One prominent bank that was founded 50-plus years ago underwent a dramatic cloud transformation that put it in the top 20 percent

of our TDS survey. In fact, there is little correlation between age of enterprise and level of tech debt.

Journeys to remediate technical debt will look very different for different companies, but some common best practices have emerged:

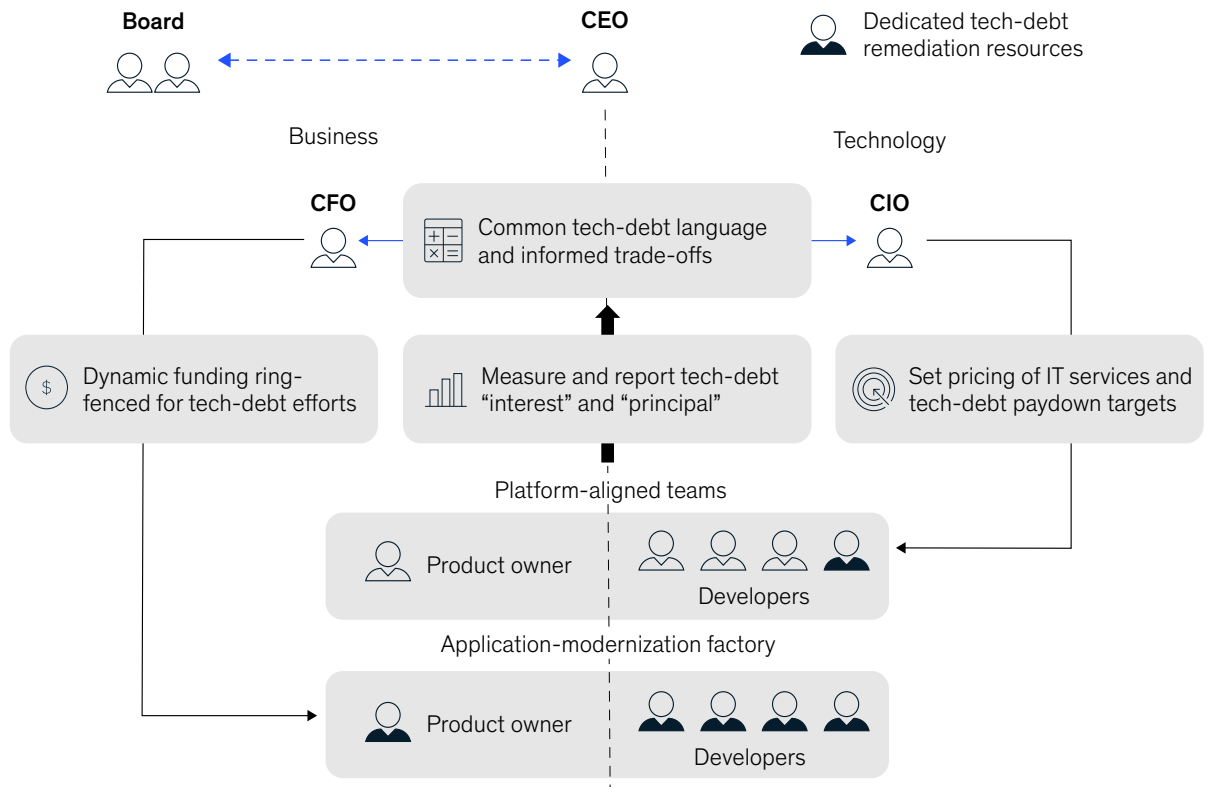
- *Measure the size and cost of tech debt.* Develop transparency into the dark matter of tech debt by getting as granular as possible to identify where it originates and quantify its impact. One large multinational insurance company, for example, struggled with unattractive business cases for modernizing the IT systems supporting a set of business units. After analyzing the systems, it learned that tech debt amounted to 15 to 60 percent of every dollar spent on IT, which had not been accounted for in the business cases. One large North American bank learned that its more than 1,000 systems and applications together generated over \$2 billion in tech-debt costs.
- *Price tech debt into all IT services.* Once companies have transparency into their tech debt and agree on its size, they need to price it into all their IT work. That means that for any IT development, the cost of the corresponding tech debt is factored in. As a result, what business units pay for IT services will dynamically change over time based on the decisions they make around growing or paying down technical debt.
- *Tailor the remediation program.* Companies may have similar tech-debt figures but vastly different profiles. They need to develop a tech-debt remediation program tailored to their specific profile. We have found that there are multiple archetypes that define a business's IT profile, each one requiring a different tech-debt-reduction approach. Companies with large and old core systems wrapped in a multitude of modern applications, for example, will need to prioritize application remediation and redesign their architecture. Those with slick front-end but highly manual back-end processes typically need to focus on automating their operational backbone from scratch.
- *Establish an operating model to systematically optimize tech debt.* Tech-debt scoring provides a common language that allows the business

and technology sides of the company to decide together on trade-offs between investing in business enablement versus paying down tech debt. In practice, this means providing the CEO and board with transparency into the true costs of tech debt and how it affects IT investments. The CFO and CIO can then agree on trade-off priorities, which the CIO can use to develop strategies with his or her teams to address tech debt.

have platform-aligned teams can dynamically allocate resources to address tech debt across applications. In the case of major efforts—the unavoidable total replacement or decommissioning of a large system, such as an enterprise resource planning (ERP) system—companies can stand up an application-modernization factory. Reports on savings and improvements from these tech-debt-reduction efforts are provided to the CIO, CFO, and CEO to inform and shape further tech-related decisions (Exhibit 2).

Addressing technical debt relies on an effective operating model. For example, companies that

Exhibit 2  
**An efficient operating model enables business/technology cooperation on tech-debt paydown.**



One large insurance company enacted this approach by committing to making tech debt a strategic priority at the board level. Analysis showed a tech-debt level in the millions of euros, providing an economic view of IT assets that aligned with the architectural reality. This common understanding helped in setting up a fundamental change in how the CIO and CFO jointly set the ongoing technology agenda. They established a pricing mechanism of “discounts and taxes” on all internal IT service costs to account for the funds needed to optimize the underlying tech debt. These pricing incentives led the business to prioritize technology approaches

that paid down technical debt, which in turn accelerated the ongoing technology-modernization program.

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Technical debt is not merely a “house-cleaning” chore; it is a fundamental issue that works like an anchor to slow down any tech-driven initiative. Companies that take the time to address it thoughtfully and carefully will be the ones best able to harness technology to drive revenue and innovation at scale.

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